Annals of Clinical Biochemistry

VOLUME 25, 1988

The Journal of the Association of Clinical Biochemists edited in collaboration with de Nederlandse Vereniging voor Klinische Chemie published by Blackwell Scientific Publications Oxford London Edinburgh Boston Palo Alto Melbourne

Annals of Clinical Biochemistry

EDITOR
DAVID L WILLIAMS
Royal Berkshire Hospital, Reading

ASSOCIATE EDITORS
JOHN COOK
Royal Sussex County Hospital, Brighton
GEORGE ELDER
Welsh National School of Medicine, Cardiff
STEPHEN HALLORAN
St Luke's Hospital, Guildford

EUROPEAN EDITOR
G J VAN STEKELENBURG
Wilhelmina Kinderziekenhuis, Utrecht

INTERNATIONAL EDITORS
Kunihiro Ueda, Kyoto, Japan
Graham White, Bedford Park, SA, Australia
Peter Wilding, Philadelphia, PA, USA

EDITORIAL BOARD
S S Brown, Birmingham
D Burnett, St Albans
T Hargreaves, Exeter
(for Association of Clinical Pathologists)
S L Jeffcoate, London
J G Lines, Ashford, Kent
(for Current Advances in Clinical Chemistry)
A H J Maas, Utrecht
V Marks, Guildford

D W Moss, London
R B Payne, Leeds
J H H Thijssen, Utrecht
P J J van Munster, Nijmegen
G Walters, Bristol
(for Royal College of Pathologists)

A Westwood, Edinburgh

ASSOCIATION OF
CLINICAL BIOCHEMISTS
President: P D Griffiths, Glasgow
Chairman: Peter Scott, Birmingham
Hon. Secretary: Ann M Kelly, Paisley
Chairman: Publications Advisory Committee:
Stephen Richardson, Middlesbrough

The Annals of Clinical Biochemistry is published for the Association of Clinical Biochemists Ltd, 30 Russell Square, London WC1B 5DT, in association with de Nederlandse Vereniging voor Klinische Chemie, by Blackwell Scientific Publications Ltd, Osney Mead, Oxford OX2 0EL.

Subscription information. The Annals of Clinical Biochemistry is published bi-monthly (1 volume per annum) and the subscription prices for 1988 are £54.00 (UK), £65.00

(overseas except North America), \$105.00 (US and Canada), in all cases post free. Orders for current subscriptions and back issues should be sent to Blackwell Scientific Publications Ltd, P.O. Box 88, Oxford OX2 0NE; all other business correspondence, including orders for offprints, should be addressed to Blackwell Scientific Publications Ltd, Osney Mead, Oxford OX2 0EL (telephone no. 0865 240201, telex 83355 Medbok G, fax 0865 721205).

Despatch. The Journal is dispatched within Europe by surface mail, to other continents by various forms of air speeded delivery: to the US* by air freight for forwarding by second class post, to India by air freight for guaranteed local delivery, and to all other countries by Accelerated Surface Post.

Copyright and photocopying. © 1988 Association of Clinical Biochemists. Authorization to photocopy for internal or personal use or the internal or personal use of specific clients is granted by the Association of Clinical Biochemists for libraries and other users registered with the Copyright Clearance Center Transactional Reporting Service, provided that the base fee of \$03.00 per copy is paid directly to the CCC, 27 Congress Street, Salem, MA 01970, USA. This consent does not extend to other kinds of copying, such as copying for general distribution for advertising or promotional purposes, for creating new collective works or for resale. Special requests should be addressed to the Editor.

Other business correspondence, including orders for offprints, should be sent to Blackwell Scientific Publications Ltd, Osney Mead, Oxford OX2 0EL.

Advertisement bookings and enquiries should be sent to PRC Associates, St Andrew's House, 22–28 High Street, Epsom, Surrey KT19 8AH. Tel: Epsom (037 27) 42055.

*Second class postage paid at New York, NY. Post Master, send address changes to *Annals of Clinical Biochemistry*, c/o Expediters of the Printed Word Ltd, 515 Madison Avenue, New York, NY 10022.

Statements of opinion are those of the contributors only, and do not commit the Editors or the Association of Clinical Biochemists in any way.

CONTENTS OF VOLUME 25

VOLUME 25 PART 1 JANUARY 1988

(US s for ld be Ltd, other s for kwell lead, 0201, 5). The conducted is by

ociaon to r the ients nical users enter vice, py is reet, s not h as tising new uests

iding kwell lead,

ould ouse, SAH.

NY.
als of
the
New

the the nical

Guest Editorial	
The standardisation of enzyme activity measurements Donald Moss	1
Review Article	1
The clinical use and measurement of theophylline David J F Rowe, Ian D Watson, John Williams and David J Berry	4
Original Articles	4
Chemiluminescence immunoassay for progesterone in plasma incorporating actidinium est	0.5
labelled antigen	
S A Miller, M S Morton and A Turkes	27
Development of a direct fluoroimmunoassay for serum levels of 17-hydroxyprogesteroi	ne
BA El-Gamal, SA Eremin, DS Smith and J Landon	35
Design of the immunogen and label for use in a fluoroimmunoassay for paracetamol	40
G Gallagher, R Coxon, J Landon, C J Rae and R Abukinesha	42
Development of a specific polarisation fluoroimmunoassay for paracetamol in serum	40
Ruth E Coxon, G Gallacher, J Landon and Christine Rae	49
Burn and trauma associated proteinuria: the role of lipid peroxidation, renin and myoglob	
Peter Gosling, Anne J Sutcliffe, Mark A C S Cooper and Alan F Jones	
The relative merits of acute phase proteins in the recognition of inflammatory conditio	ns
J Calvin, G Neale, K J Fotherby and C P Price	60
An immunoturbidimetric method for the measurement of beta-2 microglobulin in serum at	nd
plasma on a centrifugal analyser	
CR Tillyer and Y Rawal	67
Investigation of the use of bilirubin oxidase to measure the apparent unbound bilirub	oin
concentration in human plasma	
Monica E Goldfinch and Gerald A Maguire	73
An external quality assessment scheme for total bilirubin	
Keith R Johnson	78
Neurone specific enolase in amniotic fluid: a potential marker of anencephaly	
K Spencer and P Carpenter	85
The effect of storage temperature and physical state on the performance of antisera	in
radioimmunoassay after long-term storage	
D A Middleton, L M Morgan, G W Aherne and V Marks	89
Plasma sodium and potassium measurement: minimising ISE-flame differences usi	ing
specimens from patients	
Leslie J Russell, Stephen C H Smith and Brendan M Buckley	96
Sodium measurements in the presence of paraproteins by four direct ISE methods and flat	me
photometry compared	
David Burnett, Gwendolen J Ayers, Sherab C Rumjen and Terence F Woods	102
Short Reports	
The detection and quantitation of paraproteins in a quality assessment scheme	
R H Eaton, J I Robertson and J G Templeton	110
Negative interference in a kinetic Jaffé method for serum creatinine determination	
A M Cruickshank, F C Ballantyne and A Shenkin	112
Separation of serum retinol from carotenoids using normal phase disposable cyano colum	
Jannine Kozub, BV Milborrow and A G Netting	114
Ultrasensitive staining for proteins after agarose electrophoresis of unconcentral	
cerebrospinal fluid	
G Keir and E J Thompson	116
Letter to the Editor	118
Erratum	118
Defenses	119
Referees	117

VOLUME 25 PART 2 MARCH 1988

Personal View
Audit of therapeutic drug monitoring
Michael J Hallworth
Review Article
A practical approach to the investigation of amino acid disorders
M A Edwards, S Grant and A Green
Diagnosis of familial hypercholesterolaemia using DNA probes for the low-density
lipoprotein (LDL) receptor gene A E Armston, S A Iverson and J F Burke
HbA ₁ in the diagnosis of factitious remission of diabetes
177 - 5771 - 5641 - 1343
A J Krentz, P J Hale, E C Albutt and M Natrass
16α-hydroxydehydroepiandrosterone sulphate
R L Wilmot, R J Mawson and R E Oakey
A simple enzymic method for the measurement of magnesium in serum and urine on a
centrifugal analyser
W M Tsang, M J Howell and A L Miller
Serum aluminium measurement by DC plasma emission spectrometry
N B Roberts and P Williams
Determination of cholesterol and triglycerides in blood: a comparison between wet chemistry
methods and a dry chemistry analyser
H C Seftel, V R Panz, S G Baker, B I Joffe and D Mendelsohn 170
Reactivation of creatine kinase activity by preincubation with buffered NAC diluent
Alan F Penny and Alison Jennings
Identification of factors limiting the accurate measurement of plasma D-penicillamine in
rheumatoid arthritis patients
Brian A Webb, Stephen J Richardson and Ian Haslock
Short Report
Haemolysis and plasma alkaline phosphatase activity
Fiona C Ballantyne, William Borland, Robert C Birrell and Helen Davidson 192
Letters to the Editor
Erratum
VOLUME 25 DADT 2 MAY 1000
VOLUME 25 PART 3 MAY 1988
P
Review Article
When and how should we measure plasma ammonia?
Anne Green

E

Iı

Effects of long-term haemodialysis on lipid, lipoprotein and apolipoprotein levels of black patients with chronic renal failure Nader Rifai, Mary E King and Domenic A Sica	242
Immunoturbidimetric measurement of serum retinol-binding protein in renal and hepatic disease	272
D D Bankson, N Rifai and L M Silverman	246 250
J Winkles, A F Jones, P Winyard, D R Blake and J Lunec	230
Anne E Barr, Donald A Cole and Alan E Clague	255
Elizabeth M S Gowans and Callum G Fraser	259
intrauterine growth retardation B McDowell, S E Evans, J B Weaver and D Little	264
Bone density and cortical thickness in nutritional vitamin D deficiency: effect of secondary hyperparathyroidism	271
V Fonseca, J E Agnew, D Nag and P Dandona	271
J P Ashby and H Thakkar	275
T G Watson and B J Stewart	280
G M Sankolli, R A W Stott, G H G Thorpe, D Smith, B T Rudd and L J Kricka An automated solid-phase 17a-hydroxyprogesterone ELISA method using a microtitre plate	288 293
K H James Yeo, Peter A Elder and John G Lewis	293
The analysis of urinary meta- and para-tyramine by gas chromatography with electron-capture detection	270
PL Walker and M Sandler	304
Kingdom: evidence from the UK external quality assessment scheme 1980–87 J Seth, I Hanning, R R A Bacon and W M Hunter	310
Analysis of proteinuria using a commercial system for automated electrophoresis and isoelectric focusing	319
PJ Jackson, CJ Sampson, E H Cooper, D Heney and J T Brocklebank Short Reports The measurement of serum unsaturated iron-binding capacity in the presence of iron-dextran	319
Clive N Kind	325
AJ Krentz	327
thyrotoxicosis in males J P Monson, A Barge, J Chowns, M Broadbent, K Noonan, R C Temple and	
Book Reviews	
VOLUME 25 PART 4 JULY 1988	
Personal View	
Deprecating the diagnostic significance of free thyroxine levels in human serum M A Al-Awqati and Mithal Hassan	335

Review Article Quality assurance of hormone analyses			
J M Burrin			340
Original Articles			
Elevated free androgen index as an indicator of polycystic ovaries in oligomenorrhoo	ea witho	ut	
obesity or hirsuties			
J A Eden, J Place, G D Carter, J Jones, J Alaghband-Zadeh and M Pawson		••	346
Factors influencing the free androgen index in a group of subfertile women with nor	mal		
ovaries J A Eden, G D Carter, J Jones, J Alaghband-Zadeh and M Pawson			350
Salivary and plasma free testosterone and androstenedione levels in women using or	 ol		330
contraceptives containing desogestrel or levonorgestrel	aı		
L M J W Swinkels, P M M Meulenberg, H A Ross and Th J Benraad			354
Evaluation of an immunoassay for plasma sex hormone-binding globulin: comparison	n with	••	334
steroid-binding assay under physiological and pathological conditions	, with		
CVC : 1 ITINV			360
The use of an intact molecule parathyroid hormone assay in disorders of calcium me	tabolien	n	300
E J Bicknell and W Van't Hoff	tabolish		367
A simplified scheme for the investigation of thyroid function in chronic liver disease	**	• •	307
P Bannister, L Shapiro, S Faye and R Bolton			373
Early diagnosis of myocardial infarction by timed sequential enzyme measurements	••		313
P O Collinson, S B Rosalki, M Flather, R Wolman and T Evans			376
Creatine determinations as an early marker for the diagnosis of acute myocardial int	arction	••	510
J Delanghe, M De Buyzere, I De Scheerder, D Vogelaers, J Vandenbogaerde,			
A-M Van Den Abeele, P Gheeraert and R Wieme			383
Body composition and plasma creatine kinase activity			
R Swaminathan, CS Ho and SPB Donnan			389
Performance of screening tests for porphyria			
A C Deacon			392
Zinc absorption in haemodialysis patients			
John W Foote and Lesley J Hinks	••	• •	398
The acidification response of normal subjects to ammonium chloride using a 3-day l			
Ian D R Fry, Paulette E Cusick, William C Alston, Bruce Montgomery and John	ı E Tov	ey	403
The relationship between theophylline, caffeine and heart rate in neonates			100
S Nadkarni, A W M Hay, S Faye and P J Congdon	• •	• •	408
A computer program for rapid generation of receiver operating characteristic curve	s and		
likelihood ratios in the evaluation of diagnostic tests			411
Thomas G Pellar, Fred Y Leung and A Ralph Henderson	o for	••	411
Serum albumin by dye-binding: bromocresol green or bromocresol purple? The cas conservatism	e ioi		
Jean M McGinlay and R B Payne			417
A simple method for determination of plasma thiocyanate	••		41/
M Falkensson, P Lundquist, H Rosling and B Sörbo			422
Serum amylase activity determination: commutability of control materials in a new	method		, ,,,,
F Ceriotti, U De Luca, C Franzini, L Prencipe and V Rizza			424
Correlates of diabetes markers with erythyrocytic enzymes decomposing reactive of	xvgen		
species	76-		
L L Tho, J K Candlish and A C Thai			426
Serum fructosamine does reflect levels of glycated serum albumin in insulin-depend	ent		
diabetics			
DR Lloyd and J Marples			432
The effect of calibration on the between-laboratory variation of serum fructosamine	3		
R P Hill			435
Short Reports			
Glycosylated proteins in patients with insulinoma			
P J Hale, G N Turner and M Nattrass			440
Measurement of albumin in urine by end-point immunonephelometry			4.40
Ronald J Stamp	**	••	442
Letters to the Editor	• •		444

VOLUME 25 PART 5 SEPTEMBER 1988

Review Articles	
The measurement of ionised calcium in blood plasma B M Buckley and L J Russell	447
B M Buckley and L J Russell	44/
service	
W A Ratcliffe, G D Carter, M Dowsett, S G Hillier, J G Middle and M J Reed	466
Analytical reviews in clinical biochemistry: the measurement of urate	400
C P Price and D R James	484
Biochemistry and clinical significance of lipoprotein (a)	101
R Houlston and W Friedl	499
Original Articles	1,,,
HPLC analysis of 6-mercaptopurine and metabolites in extracellular body fluids	
J L Rudy, J C Argyle, N Winick and P Van Dreal	504
A simple improved method for the measurement of cyclosporin by liquid-liquid extraction of	
whole blood and isocratic HPLC	
Stephen J Fletcher and Robby A Bacchus	510
Development and evaluation of an enzyme inhibition assay for methotrexate	310
Michael G Kelly	516
Detection of antibodies to the human immunodeficiency virus by a rapid fluorescence-labelled	
immunosorbent assay	
Bernard F Rocks, Vanessa M R Bertram, M Philip Bailey, Clifford Riley and	
Barry T Thom	
Multicentre study of a new test for TSH-screening in blood spots	
PJ Brombacher, E Henkel, A C Kessler and M P Van Dieijen-Visser	530
Serum free thyroxine and free tri-iodothyronine in normal children	
J Butler, P Moore, G Mieli-Vergani and C Moniz	536
Biological activity of serum prolactin in patients with primary hypothyroidism	
Caroline R Smith, Joan Butler and Michael R Norman	540
Individual free fatty acids and lactate uptake in the human heart during severe sepsis	
G Lefevre, J F D Dhainaut, F Tallet, M F Huyghebaert, J Yonger, J F Monsallier	
and D Raichvarg	546
Urinary C-peptide: A useful tool for evaluating the endogenous insulin reserve in cohort and	
longitudinal studies of diabetes in childhood	
C E de Beaufort, N C den Boer, G J Bruining, G A M Eilers, R van Strik	
and T Weterings	552
The Middle East external quality assessment scheme for clinical chemistry	560
Robby A Bacchus, David G Bullock, George A Noy and Thomas P Whitehead Antenatal diagnosis of neural tube defects using a coated bead immunoassay for	
acetylcholinesterase in amniotic fluid	
	569
Shobhna Mehta and Kevin Spencer	30;
abandoned	
J D H Cooper, D C Turnell, B Green, D J Wright and E J Coombes	57
Short Reports	
Urinary catecholamine assay by HPLC: in vitro interference by some drugs	
DF Davidson	. 583
The in vitro stability of catecholamines in whole blood	
A G Rumley	. 58
Serum fructosamine in patients with overt and treated thyroid disease	
MJ Waterson and RJ Mills	. 58
Letters to the Editor	
Association of Clinical Biochemists—Special Publications	. 59

VOLUME 25 PART 6 NOVEMBER 1988

Ames Award-Winning Lecture, 1987	
A study of the hypouricaemic effect of tiaprofenic acid	
Vivienne Lyfar, L Fernandes, Elizabeth Thornton and J G H Cook	595
Review Article	
The role of the laboratory in the investigation of infertility	
W R Butt and Susan M Blunt	601
Original Articles	
Reference values for analytes of 24-h urine collections	
Sheila A Bingham, Rhys Williams, Timothy J Cole, Christopher P Price	
and John H Cummings	610
Neuroblastoma—When are urinary catecholamines and their metabolites 'Normal'?	
D J Worthington, E M Hammond, B B Eldeeb, A Green, G M Addison,	
P H Morris Jones and J R Mann	620
Long-term performance of the fructosamine assay	(07
M H Dominiczak, S M MacRury, J M Orrell and K R Paterson	627
Variability of capillary plasma glucose in healthy individuals in repeated 75 g oral glucose tolerance tests	
	(24
ST Cummings and CG Fraser	634
precipitation procedures	
A IV Doublings and T Donner	638
Small scale sandwich enzyme immunoassay for human chorionic gonadotropin using a new	038
micro-transferable plastic bead as solid phase	
W W D ID D W	645
Measurement of theophylline in dried blood spots by spectrophotometric enzyme	043
immunoassay	
J M Rattenbury and Tracy Taylor	650
Clinical and laboratory evaluation of a two-site immunoradiometric assay for intact	050
parathyroid hormone	
DJ Newman and J P Ashby	654
A non-extraction HPLC method for the simultaneous determination of serum paracetamol	051
and salicylate	
C M Dawson, T W M Wang, S J Rainbow and T R Tickner	661
Maternal serum neurone specific enolase in the diagnosis of anencephaly and other neural	
tube defects	
K Spencer and P Carpenter	668
Tea consumption and serum lipids in a Libyan population in Benghazi	
D S Sheriff and M El Fakhri	670
Some effects on light scattering intensity and red blood cell size histograms due to sphering	
P C Bartels, P W Helleman, A F M Roijers and J B J Soons	673
Evaluation of red blood cell size distribution histograms: the fraction of microcytes	
P C Bartels, P W Helleman and J B J Soons	680
An intra-erythrocyte low molecular weight lead-binding protein in acute and chronic lead	
exposure and its possible protective role in lead toxicity	
Yvette Lolin and Patrick O'Gorman	688
The evaluation of erythrocyte thiamin status in man, and its comparison with erythrocyte	
transketolase activity measurements	
M Baines and G Davies	698
Short Reports	
Erythrocyte hydroxymethybilane synthase activity in a Chinese family with acute intermittent	
porphyria	701
FY Lee, KJ Hsiao, YT Tsai, SD Lee, SJ Wu and H S Jeng	706
Use and abuse of the Toxi-Lab TLC system Sheila Dawling and Brian Widdop	700
Shella Dawling and Brian Widdop	708